Taketoshi HINODE*: Desmids from the northern district of Tokushima Prefecture (1)

日出武敏*: 徳島県北部地方のチリモ類 (1)

The area of investigation includes the north-western part of Tokushima Prefecture, i. e. Awa-cho in Awa-gun, Waki-cho and Mima-cho in Mima-gun and Mino-cho in Miyoshi-gun. From the 1st to the 7th August in 1962, the author participated in the members of the 4th scientific survey of remote districts of Tokushima Prefecture and could gather material of freshwater algae. In this collection pretty much desmids were contained.

This district extends from southern parts of Sanuki Mountain Range to the north coast of the Yoshino River. The mountains are all relatively low, the highest being 1057 m above the sea, and are covered with rather thin woods, so that they are comparatively arid and swamps or marshes are not to be seen there. However, near the foot of the mountain range many pools or ponds for the irrigation of paddy fields are scattered. In these stagnant waters various hydrophytes grow rankly. They are *Myriophyllum verticillatum* L., *Utricularia vulgaris* L. var. *japonica* (Makino) Tamura, *Trapa bispinosa* Roxb. var. *iinumai* Nakano, *T. incisa* Sieb. et Zucc., *Scirpus mucronatus* L. subsp. *robustus* T. Koyama, *Sc. lacustris* L. subsp. *creber* (Fern.) T. Koyama, *Sc. lineolatus* Fr. et Sav., *Eleocharis kuroguwai* Ohwi, *Isachne globosa* O. Kuntze, *Alisma canaliculata* A. Br. et Bouche, *Potamogeton octandrum* Poir var. *miduhikimo* (Makino) Hara, *P. distinctus* Bennett, *Oenanthe javanica* (Blume) DC., *Nymphaea tetragona* Georgi, *Brasenia schreberii* J.F. Gmel., *Spirodela polyrhiza* (L.) Schleid., *Murdannia keisak* (Lassk.) Hand-Mzt., *Salvinia natans* (L.) All., *Nitella* spp. etc. The hydrophytes-rich ponds produce fairly many desmids. Some of the ponds have been recently repaired, and the woods grown near their margins have been cut off. In such ponds desmids can hardly be seen.

The bedrock of Sanuki Mountain Range consists of Izumi sandstone of the upper Cretaceous period. The southern foot of the range is overlaid by Diluvial stratum composed of sand and gravels. Above mentioned ponds and pools are all on this Diluvial stratum.

The climate of this district is mild and somewhat arid, but in winter rather

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cool for Tokushima Prefecture excepting the mountainous regions. The climatical data in 1964 at Iwakura in Waki-cho are as follows:

	Feb.	May	Aug.	Nov.	Ann.
Mean Temperat. (degr. C)	3.2	18.9	28.0	11.4	15.9
Max. Temperat. (degr. C)	7.6	25.6	33.0	16.9	21.3
Minim. Temperat. (degr. C)	−0.1	12.1	22.9	5.7	10.3
Precipit. (mm)	69	53	202	66	1211

The desmid flora of this district seems to be not so rich. Most species are cosmopolitan, and peculiar or interesting forms are rather few. *Closterium*-species and *Cosmarium*-species are comparatively plentiful, but *Euastra* and *Micrasteriates* are very few. Any species of *Cylindrocystis*, *Spirotaenia*, *Triploceras* and *Tetmemorus* could not be found. *Arthrodesmus* and *Xanthidium* are rather poorly represented in Tokushima Prefecture. Of the genus *Staurastrum* the greater part of the species are common, and noteworthy ones are few. The author thinks that such a characteristic of the desmid flora may be influenced strongly by the geological factors and the simplicity of the ecological conditions of desmid-producing places. Neverthless in this district some interesting or noteworthy taxa are found. For instance they are: *Closterium leibleinii* Kütz. var. *recurvatum* West & West, *Pleurotaenium crenulatum* (Ehrenb.) Rabenh., *Pl. truncatum* (Bréb). Näg. var. *farquharsonii* (Roy) West & West, *Euastrum pectinatum* Bréb. var. *reductum* Taylor, *Cosmarium dentiferum* Corda, *C. hians* Borge, *C. platydesmium* (Nordst.) Nordst. & Schmidle, *C. synduorhabdum* Skuja, *C. visbyense* Grönbl., *Staurastrum depressiceps* Scott & Grönbl. var. *planiceps* Scott & Grönbl., *St. cyclacanthum* West & West var. *armigerum* Scott & Prescott, etc.

The localities where the collections were made for this paper are:

1. Hiruta-ike, Awa-cho. A relatively large pond, where desmids are rather scarce.
2. Small pools at Masahiro, Awa-cho. Many hydrophytes grow abundantly, desmids are fairly rich.

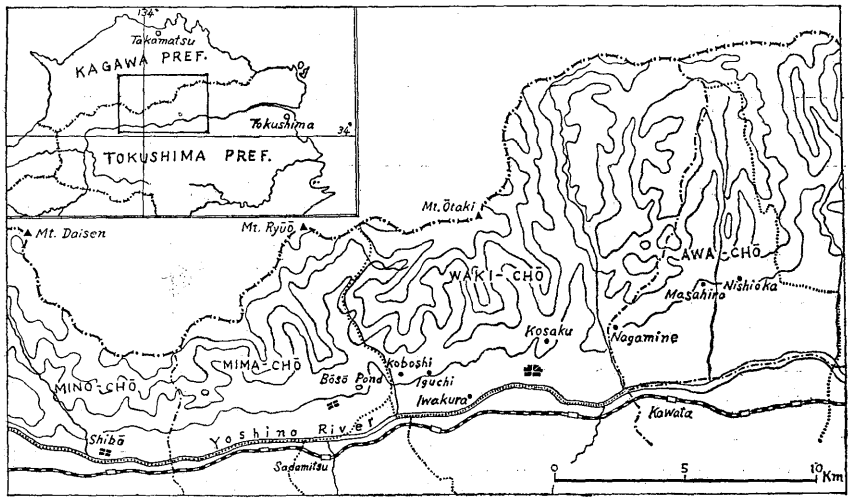
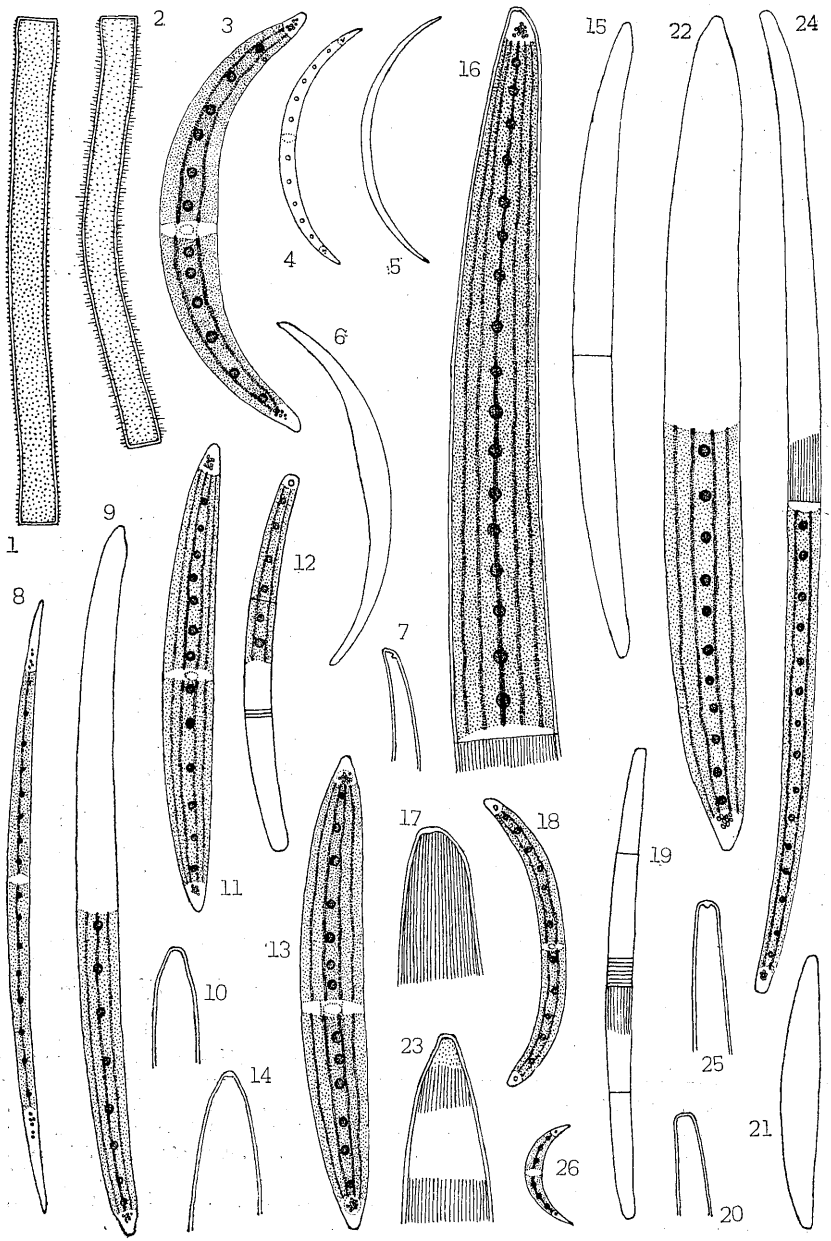


Fig. 1. 徳島県下におけるチリモ採集地.

3. Small pools at Nishioka, Awa-cho. A plenty of hydrophytes grow, the bottoms are covered with *Nitella* and *Utricularia*. Demids are very abundant and diverse in species.
4. Small pools at Kosaku, Waki-cho. Hydrophytes are rather sparse and desmids are not plentiful.
5. A pond at Iwakura, Waki-cho. An old and hydrophytes-rich pond, near its margins *Sparganium erectum* L. grows.
6. A pond at Koboshi, Waki-cho. The natural condition is very near to that of preceding pond, but desmid flora is quite different.
7. Boso-ike, Mima-cho. The largest pond in this district, desmids are rather scarce.
8. A small pond at the top of Mt. Ryūo (1057 m high). A shaded pond, its surface is perfectly covered with *Potamogeton fryeri* A. Bennett. No desmids

Fig. 2. *Conatozygon monotaenium* De Bary var. *pilosellum* Nordst. 2. *G. pilosum* Wolle. 3. *Closterium leibleinii* Kuetz. var. *recurvatum* West & West. 4. *Cl. parvulum* Bréb. var. *angustum* West & West. 5. —— var. *angustissimum* Hinode. 6, 7. *Cl. dianae* Ehrenb. var. *pseudodianae* (Roy) Krieg. 8. *Cl. idiosporum* West & West. 9, 10. *Cl. acerosum* (Schrank) Ehrenb. var. *borgei* (Borge) Krieg. 11. ——var. *parvum* Hinode. 12. *Cl. abruptum* W. West. 13, 14. *Cl. pseudolunula* Borge. 15-17. *Cl. turgidum* Ehrenb. 18. *Cl. cynthia* De Notaris var. *jenneri* (Ralfs) Krieg. 19, 20. *Cl. juncidum* Ralfs. 21. *Cl. tumidum* Johns. 22, 23. *Cl. attenuatum* Ehrenb. 24, 25. *Cl. lineatum* Ehrenb. 26. *Cl. venus* Kütz. var. *incurvum* (Bréb.) Krieg. 15, ×150; 3-6, 8, 9, 11-13, 16, 18, 19, 21, 22, 24, 26, ×270; 1, 2, 7, 10, 14, 17, 20, 23, 25, ×425.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were to be seen.

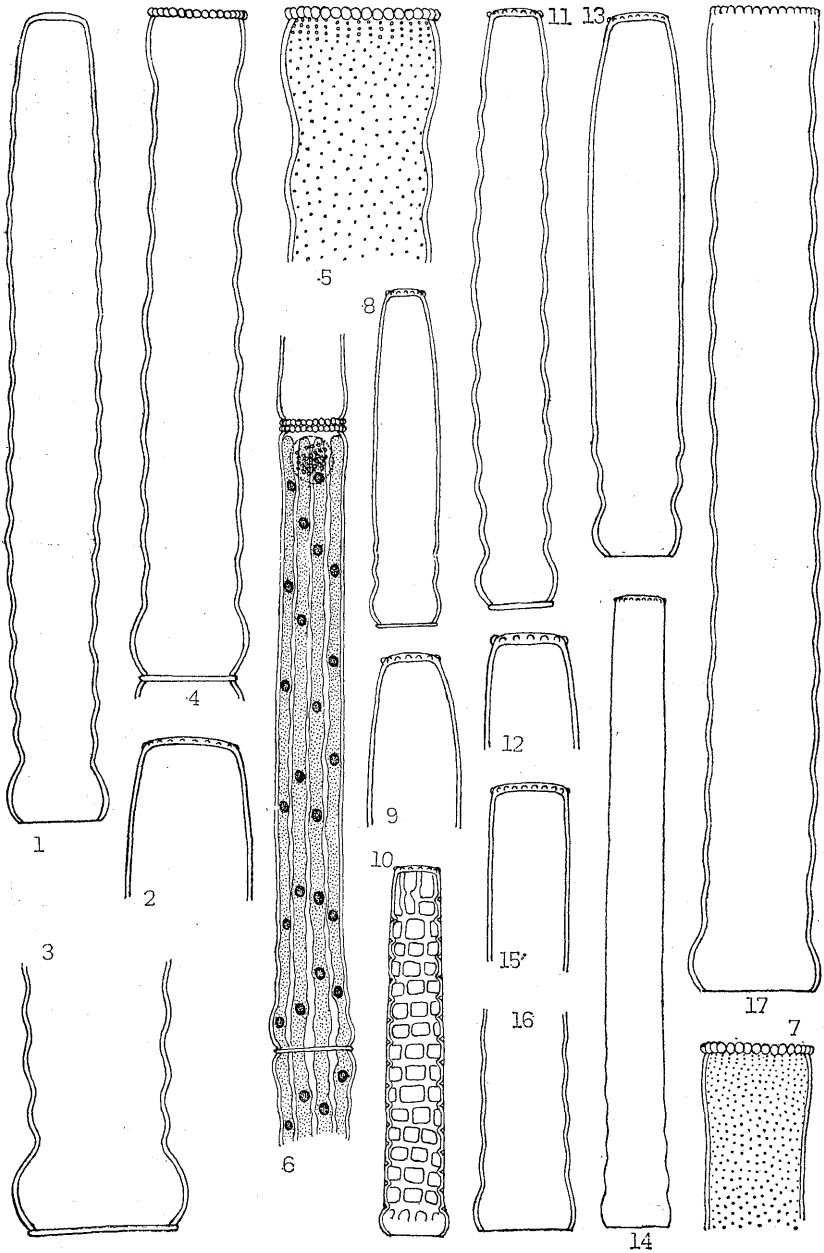
9. A very small pool at Nagamine, Awa-cho. Both hydrophytes and desmids are very poor.
10. A pond at Nagamine, Awa-cho. *Nitella*, *Trapa* and other hydrophytes are fairly abundant, and not a few desmids are seen.
11. A narrow ditch at Nagamine, Awa-cho. *Trapa*, *Utricularia* and others thickly grow, and desmids are very abundant.
12. A pond at Shibo, Mima-cho. The bottom is covered by dwarf hydrophytes, a considerable number of desmids are seen.

Summary of the Species Reported

	Species	Varieties	Forms	Total
Netrium	1	1		2
Gonatozygon	2	1		3
Penium	2			2
Closterium	24	13 (new 1)		37 (new 1)
Pleurotaenium	12	4	2 (new 1)	18 (new 1)
Euastrum	5	5 (new 1)		10 (new 1)
Micrasterias	3			3
Actinotaenium	5	2	1	8
Cosmarium	47 (new 2)	13 (new 2)	3 (new 1)	63 (new 5)
Xanthidium	1			1
Arthrodesmus	1	1		2
Staurastrum	25	18 (new 1)	3	46 (new 1)
Sphaerozosma	1	1		2
Spondylosium	1			1
Desmidium	2			2
Hyalotheca	1			1
Total	133 (new 2)	59 (new 5)	9 (new 2)	201 (new 9)

1. **Netrium** *digitus* (Ehrenb.) Itzigs. & Rothe Long. 158–242 μ; lat. 37–57 μ. Hab. 2, 3, 4, 7, 11.
2. ——— var. *lamellosum* (Bréb.) Grönbl. Long. 256 μ; lat. 40 μ. Hab. 3, 10.

Fig. 3. 1-3. *Pleurotaenium crenulatum* (Ehrenb.) Rabenh. 4, 5. *Pl. elatum* (Turn.) Borge. 6, 7. *Pl. subco onulatum* (Turn.) West & West. 8, 9. *Pl. truncatum* (Bréb.) Nag. var. *farquharsonii* (Roy) West & West. 10. *Pl. verrucosum* (Bail.) Lund. 11, 12. *Pl. coronatum* (Breb.) Rabenh. var. *nodulosum* (Bréb.) W. West f. *undulatum* Hinode. —— —— f. *constrictum* Krieg. 14-16. *Pl. simplicissimum* Grönbl. 17. *Pl. tignum* Hinode. 1, 4, 6, 8, 10, 11, 13. 14, 17, ×270; 2, 3, 5, 7, 9, 12, 15, 16. ×425.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3. **Gonatozygon** *monotaenium* De Bary Long. 120 μ; lat. 8 μ; lat apic 9 μ. Hab. 2.
4. ——— var. *pilosellum* Nordst. (Fig. 2-1) Long. 157 μ; lat. 11 μ; lat. apic. 13 μ. Hab. 2.
5. *G. pilosum* Wolle (Fig. 2-2) Long. 139 μ; lat. 13 μ. Hab. 2.
   Comparing to *G. aculeatum* Hast. this alga has more delicate spines, and seems to be less abundant in our. country.
6. **Penium** *cylindrus* (Ehrenb.) Bréb. Long. 59 μ; lat. 16 μ. Hab. 3, 7.
7. *P. margaritaceum* (Ehrenb.) Bréb. Long. 89 μ; lat. 17 μ. Hab. 3, 4, 7.
8. **Closterium** *abruptum* W. west (Fig. 2-12) Long. 182 μ; lat 15 μ; lat. apic. 6 μ. Hab. 11.
   This is a very rare species in this district.
9. *Cl. acerosum* (Schrank) Ehrenb. var. *borgei* (Borge) Krieg. (Fig. 2-9, 10) Long. 317 μ; lat. 21 μ; lat. apic. 6 μ. Hab. 11.
   Rather slender form, about 15 times as long as broad. This alga was very rarely observed.
10. ——— var. **parvum** Hinode var. nov. (Fig. 2-11).
    Var. minor, 8-10-plo longior quam lata, apicibus rotundatis; membrana glabra achloa vel luteola.
    Long. 178-260 μ; lat 22-25 μ. Hab. 11.
11. *Cl. attenuatum* Ehrenb. (Fig. 2-22, 23) Long. 388-392 μ; lat. 33-38 μ. Hab. 2, 5, 7.
12. *Cl. cornum* Ehrenb. Long. 137 μ; lat. 6 μ. Hab. 11.
13. *Cl. costatum* Corda Long. 305 μ; lat. 31 μ; lat. apic. 13 μ. Hab. 4, 11.
14. *Cl. cynthia* De Notaris Long. 91-108 μ; lat. 12-15 μ. Hab. 10, 11.
15. ——— var. *jenneri* (Ralfs) Krieg. (Fig. 2-18) Long. 142 μ; lat. 13 μ. Hab. 11.
16. *Cl. dianae* Ehrenb. Long. 176-246 μ; lat. 15-22 μ. Hab. 2, 3, 6, 11.
17. ——— var. *brevius* (Wittr.) Petkoff Long. 111 μ; lat. 16 μ. Hab. 3, 11.
18. ——— var. *pseudodianae* (Roy) Krieg. (Fig. 2-6, 7; Fig. 10-1) Long. 170 μ; lat. 13 μ. Hab. 11.
19. *Cl. ehrenbergii* Menegh. Long. 303-351 μ; lat. 50-58 μ. Hab. 2, 3, 11.
20. *Cl. idiosporum* West & West (Fig. 2-8) Long. 220 μ; lat. 12 μ. Hab. 10.
21. *Cl. intermedium* Ralfs 218-260 μ; lat. 22 μ. Hab. 11.
22. *Cl. juncidum* Ralfs (Fig. 2-19, 20) Long. 230 μ; lat. 13 μ; lat. apic. 7 μ. Hab. 11.

23. *Cl. kuetzingii* Bréb. Long. 361 μ; lat. 16 μ. Hab. 3, 11.
24. *Cl. leibleinii* Kütz. Long. 123 μ; lat. 21 μ. Hab. 4, 6.
25. ——— var. *recurvatum* West & West (Fig. 2-3; Fig. 10-3) Long. 182 μ; lat. 28 μ. Hab. 10.
    The curvature of the cells is rather stronger, and the size is somewhat larger comparing to the typical form.
26. *Cl. libellula* Focke var. intermedium (Roy & Biss.) G. S. West Long. 118 μ; lat. 25 μ. Hab. 10, 11.
27. ——— var. *interruptum* (West & West) Donat Long. 120 μ; lat. 25 μ. Hab. 11.
28. *Cl. lineatum* Ehremb. (Fig. 2-24, 25) Long. 460 μ; lat. 20 μ; lat. apic. 6 μ. Hab. 11.
29. *Cl. moniliferum* (Bory) Ehrenb. Long. 200 μ; lat. 34 μ. Hab. 2, 7, 10, 11.
30. *Cl. nematodes* Joshua Long. 279 μ; lat. 27 μ. Hab. 10, 11.
31. *Cl. parvulum* Bréb. Long. 130-137 μ; lat. 13 μ. Hab. 1, 2, 3, 4, 6, 7.
32. ——— var. *angustissimum* Hinode (Fig. 2-5) Long. 108-117 μ; lat. 5, 5-6 μ. Hab. 3, 5.
33. ——— var. *angustum* West & West (Fig. 2-4) Long. 94-114 μ; lat. 7-10 μ. Hab. 1, 3, 6.
34. *Cl. praelongum* Bréb. Long. 438 μ; lat. 19 μ. Hab. 11.
35. ——— var. *brevius* Nordst. Long. 183-257 μ; lat. 15 μ. Hab. 10, 11.
36. *Cl. pritchardianum* Arch. Long. 447-730 μ; lat. 35-43 μ. Hab. 1, 5.
37. *Cl. pseudolunula* Borge (Fig. 2-13, 14) Long. 228 μ; lat. 34 μ; lat. apic. 6 μ. Hab. 4.
38. *Cl. ralfsii* Breb. var. *hybridum* Rabenh. Long. 425 μ; lat. 31 μ; lat. apic. 6 μ. Hab. 10, 11.
39. *Cl. setaceum* Ehrenb. Long. 303 μ; lat. 13 μ. Hab. 11.
40. *Cl. striolatum* Ehrenb. Long. 244 μ; lat. 28 μ. Hab. 11.
41. *Cl. tunidum* Johns. (Fig. 2-21) Long. 133 μ; lat. 20 μ. Hab. 11.
42. *Cl. turgidum* Ehrenb. (Fig. 2-15-17; Fig. 10-2) Long. 753 μ; lat. 47 μ. Hab. 2.
43. *Cl. venus* Kütz. Long. 65-88 μ; lat. 10-13 μ. Hab. 1, 2, 3, 7, 10.
44. ——— var. *incurvum* (Bréb.) Krieg. (Fig. 2-26) Long. 50 μ; lat. 9 μ. Hab. 1, 2, 5.
45. **Pleurotaenium** *baculoides* (Roy & Biss.) Playfair Long. 445 μ; lat. bas. 21 μ. Hab. 2.

46. *Pl. coronatum* (Bréb.) Rabenh. var. *nodulosum* (Bréb.) W. West forma **undulatum** Hinode f. nov. (Fig. 3-11, 12).

Forma paullo longior, 12-13-plo longior quam lata, lateribus usque undulatis, undulis circiter 11 visis.

Long. 540-547 μ; lat. bas. 42-44 μ; lat. apic. 25 μ. Hab. 3.

This forma can be compared with var. *fluctuatum* W. West, but easily distinguished by its rather smaller size, and attenuated apices.

47. ——— ——— f. *constrictum* Krieg. (Fig. 3-13) Long. 553-558 μ; lat. bas. 43-46 μ; lat. apic. 25 μ. Hab. 3.

48. *Pl. crenulatum* (Ehrenb.) Rabenh. (Fig. 3-1-3) Long. 830-878 μ; lat. bas. 44-49 μ. Hab. 2.

This is a very long and large species, about 18-20 times longer than broad. The basal inflations are very conspicuous and immediately above it the lateral margins are more or less strongly constricted. Through almost whole length of the sides rather finely undulated, the undulations are getting smaller towards the apices. As R. Grönblad stated in Soc. Sci. Fenn. Comment. Biol. **15**, (1956) p. 24, the apical tubercles are at one time almost invisible and at other time very faintly obvious.

□J. Ohwi: **Flora of Japan (in English)** i-ix, pp. 1067, frontispiece 1, 16 pls., 17 Figs. Oct. 1965, Smithsonian Institution 出版 $25.00 大井次三郎博士の前著「日本植物誌」第1版(1953)および「日本植物誌シダ篇」(1957)の内容をふくみ，更に大井氏によって改訂された原稿の英訳版が 10 年以上の努力の後に，米国で出版された。編集は F. G. Meyer, E. H. Walker 両氏，西欧語で書かれた日本の植物誌が，Franchet, Savatier 両氏のそれ以来約 90 年後に初めて出版された意義は大きい。言語の壁のために，外国人が日本の植物の研究に近ずくことには多くの困難があり，この種の書が国外で待望されたのは当然である。この書の出版によって逆に日本の分類学が世界の正しい批判の上に立つことも考えられる。さる外国の学者が日本人の植物の分類がある場合に判りにくいと言っていたのを聞いたこともあるが，その不満にも答えるものであろう。大井博士の前著と同様に，この書の大きい特長は，あまり個々の種以下の Taxon にはこだわらないで，大きく綜合的にフロラとしてつかんでいる点にあると思われる。属の範囲も Copeland の分類系を多くとり入れたシダ植物の一部を除いては，多少保守的に大きくとってあり，種もまた同様でる。この位の規模の書になると，ほとんど個人の能力の限界に達した努力が必要であるから，将来個人的にはこの書をしのぐ量のものは出